

## Direct synthesis of hydrogen peroxide and its integration in oxidation processes

Patent Number: EP1308416  
Publication date: 2003-05-07  
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Requested Patent: EP1308416  
Application Number: EP20020019947 20020905  
Priority Number(s): DE20011053546 20011030  
IPC Classification: C01B15/029; B01J8/02  
Equivalents: DE10153546, US2003083510, US6764671  
Cited Documents: US5500202; US3361533; EP1038833; US4336238; US2001003578

### Abstract

Organic or organic-aqueous hydrogen peroxide solution is produced by passing non-explosive gas mixture containing hydrogen and oxygen over a catalyst fixed bed in the presence of water-soluble organic solvent reaction medium. The reaction medium comprises the water-soluble organic solvent, and bromide and/or iodide. It is passed over the fixed bed with a cross-section loading of  $\geq 0.3$  m/hour. <??>Production of organic or organic-aqueous hydrogen peroxide solution includes passing non-explosive gas mixture containing hydrogen and oxygen over a catalyst fixed bed in the presence of water-soluble organic solvent reaction medium. The catalyst fixed bed comprises catalyst particles bonded to a support or a mixture of catalyst-containing and catalyst-free particles. The reaction medium is passed over the fixed bed with a cross-section loading of  $\geq 0.3$  m/hour. It comprises the water-soluble organic solvent, and bromide and/or iodide. <??>An Independent claim is also included for catalytic oxidation of organic substrate (e.g. olefin or aromatic hydrocarbon containing alkyl, alkoxy, or hydroxyl substituents), and carbonyl compounds using an organic hydrogen peroxide solution in the presence of an oxidation catalyst, e.g. titanium silicalites and vanadium, molybdenum, and/or tungsten compound.